

Date: Tuesday, 11/6/2007 1:38:14 PM
 User: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services
 Job Number : 35580
 Estimate Number : 11057
 P.O. Number :
 This Issue : 11/6/2007 S.O. No. :
 Prsht Rev. : NC
 First Issue : // Type : PURCHASED PARTS
 Previous Run : 34062
 Written By :
 Checked & Approved By :
 Comment : Est. C 02.11.26 Added P/O KJ

Drawing Name : 02.250 SUPPORT
 Part Number : D28911
 Drawing Number : D2891 REV A1
 Project Number : N/A
 Drawing Revision : A1
 Material :
 Due Date : 12/13/2007 Qty: 10 Um: Each

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
1.0	PG	PURCHASING  Comment: PURCHASING Issue P/O: <u>4996</u> C 07/11/07 HT# 19095 Description: D6104-003 Material: 17-4 PH SS (AMS 5643 OR AISI 630) as per Dwg D6104 Material release note required. Blank size makes (2) D2891-1 <u>10</u> B 35580 <u>24 08/03/07</u>
2.0	D6104003	17-4 SS Roundbar 3.25"OD  Comment: Qty.: 1.0000 Each(s)/Unit Total : 10.0000 Each(s) Support 2.25 dia
3.0	PACKAGING 1	PACKAGING RESOURCE #1  Comment: PACKAGING RESOURCE #1 Recieve & Inspect for Transit Damage Ensure Material Release Note is attached <u>7 11/29 (1)</u>
4.0	MORI SEIKI DOOSAN	MORI SEIKI CMC LATHE LARGE  Comment: MORI SEIKI LATHE Turn blank for Haas as per Folio FA046 <u>24 08/03/26 / 24 08/03/07</u>
5.0	QC1	INSPECT ALL DIM TO DIM SHEET  Comment: INSPECT ALL DIM TO DIM SHEET <u>24 08/03/27</u>

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	/	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
			/					
			/					

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Tuesday, 11/6/2007 1:38:14 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 02.250 SUPPORT

Job Number: 35580

Part Number: D28911

Job Number:



Seq. #: Machine Or Operation:

Description :

6.0

HAAS1

HAAS CNC VERTICAL MACHINING #1



Comment: HAAS

Machine as per Folio FA046

Tumble & Deburr

J.L 1BG 08-05-08

7.0 QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

J.L 1BG 08-05-08

8.0 QC8

SECOND CHECK



Comment: SECOND CHECK

88 08/05/10

9.0 POWDER COATING

POWDER COATING



35580

28911

10/05/2008

Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.2) as per QSI 005 4.3

08-05-06

S.21 11.30

#1 406.0 F

#2 0 F

#3 0 F

#4 0 F

10.0 QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



M. 08/05/08

Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

11.0 PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: LG

08-05-08

20

12.0 QC21

FINAL INSPECTION/W/O RELEASE



08/05/12 F

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



MF 08-05-09

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD				Work Order:	35580
Description: Ø2.250 Support				Part Number:	D2891-1
Inspection Dwg: D2891 Rev. A1				Page 1 of 1	

Inspect dimensions highlighted on inspection sheet drawing D2891 Rev.A1/DSK076 Rev.A and record below:

				Recorded Actual Dimensions					
Dim	Min	Max	Go/No Go Gauge	1	2	3	4	By	Date
Lathe Section									
A	2.274	2.279		2.279	2.279	2.279	2.279		
B	3.702	3.722		3.710	3.710	3.710	3.710		
C	2.564	2.584		2.575	2.575	2.575	2.575		
D	0.718	0.738		.728	.728	.728	.728		
E	0.090	0.110		.100	.100	.100	.100		
F	2.464	2.484		2.474	2.474	2.474	2.474		
G	2.029	2.049		2.039	2.039	2.039	2.039		
H	2.964	2.984		2.975	2.975	2.975	2.975		
I	0.913	0.933		.923	.923	.923	.923		
J	0.022	0.042		.03	.03	.03	.03		
K	0.090	0.110		.100	.100	.100	.100		
L									
HAAS Section									
AA	0.188	0.193	DT8706	.189	.189	.189	.189		
AB	0.240	0.260		.252	.252	.251	.250		
AC	0.115	0.150		.124	.125	.124	.124		
AD	0.040	0.060		.051	.052	.053	.053		
AE	0.010	0.020		.015	.015	.015	.015		
AF	0.240	0.260		.250	.250	.250	.250		
AG	0.290	0.310		.310	.310	.310	.310		
AH	0.115	0.150		.137	.137	.136	.136		
AI	0.454	0.474		.462	.460	.457	.459		
AJ	2.779	2.789		2.781	2.781	2.781	2.781		
AK	0.240	0.260		.250	.250	.250	.250		
AL	1.002	1.042		1.034	1.036	1.036	1.038		
AM	0.053	0.073		.063	.063	.063	.063		
AN	0.257	0.262	DT8683	.258	.258	.258	.258		
AO	1.663	1.683		1.675	1.671	1.673	1.672		
AP	0.053	0.073		.063	.063	.063	.063		
AQ	0.022	0.042		.032	.032	.032	.032		
AR									
AS									

Accept/Reject

Measured by:	JP 08/03/17	Audited by:	8.8
Date:		Date:	08/05/10

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

DART AEROSPACE LTD				Work Order:	35580
Description: Ø2.250 Support				Part Number:	D2891-1
Inspection Dwg: D2891 Rev. A1				Page 1 of 1	

Inspect dimensions highlighted on inspection sheet drawing D2891 Rev.A1/DSK076 Rev.A and record below:

Dim	Min	Max	Go/No Go Gauge	Recorded Actual Dimensions				By	Date
				1	2	3	4		
Lathe Section									
A	2.274	2.279		2.279	2.279	2.279	2.279		
B	3.702	3.722		3.710	3.710	3.710	3.710		
C	2.564	2.584		2.575	2.575	2.575	2.575		
D	0.718	0.738		.728	.728	.728	.728		
E	0.090	0.110		.100	.100	.100	.100		
F	2.464	2.484		2.474	2.474	2.474	2.474		
G	2.029	2.049		2.039	2.039	2.039	2.039		
H	2.964	2.984		2.974	2.974	2.974	2.974		
I	0.913	0.933		.923	.923	.923	.923		
J	0.022	0.042		.03	.03	.03	.03		
K	0.090	0.110		.100	.100	.100	.100		
L									
HAAS Section									
AA	0.188	0.193	DT8706	.189	.189	.189	.189		
AB	0.240	0.260		.251	.251	.250	.251		
AC	0.115	0.150		.125	.124	.124	.125		
AD	0.040	0.060		.052	.050	.051	.051		
AE	0.010	0.020		.015	.015	.015	.015		
AF	0.240	0.260		.250	.250	.250	.250		
AG	0.290	0.310		.310	.310	.310	.310		
AH	0.115	0.150		.138	.138	.138	.138		
AI	0.454	0.474		.462	.464	.464	.463		
AJ	2.779	2.789		2.784	2.784	2.784	2.784		
AK	0.240	0.260		.250	.250	.250	.250		
AL	1.002	1.042		1.039	1.041	1.038	1.037		
AM	0.053	0.073		.063	.063	.063	.063		
AN	0.257	0.262	DT8683	.258	.258	.258	.258		
AO	1.663	1.683		1.673	1.673	1.675	1.673		
AP	0.053	0.073		.063	.063	.063	.063		
AQ	0.022	0.042		.032	.032	.032	.032		
AR									
AS									
Accept/Reject									

Measured by: 20 / J.L
 Date: 08/03/10

Audited by: 8/8 / J.L
 Date: 08/05/10

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	#

DART AEROSPACE LTD			Work Order:	35580
Description: Ø2.250 Support			Part Number:	D2891-1
Inspection Dwg: D2891 Rev. A1			Page 1 of 1	

Inspect dimensions highlighted on inspection sheet drawing D2891 Rev.A1/DSK076 Rev.A and record below:

Dim	Min	Max	Go/No Go Gauge	Recorded Actual Dimensions				By	Date
				1	2	3	4		
Lathe Section									
A	2.274	2.279		2.279	2.279				
B	3.702	3.722		3.710	3.710				
C	2.564	2.584		2.574	2.574				
D	0.718	0.738		.728	.728				
E	0.090	0.110		.100	.100				
F	2.464	2.484		2.474	2.474				
G	2.029	2.049		2.039	2.039				
H	2.964	2.984		2.975	2.975				
I	0.913	0.933		.923	.923				
J	0.022	0.042		.03	.03				
K	0.090	0.110		.100	.100				
L									
HAAS Section									
AA	0.188	0.193	DT8706	.188	.188				
AB	0.240	0.260		.250	.250				
AC	0.115	0.150		.140	.140				
AD	0.040	0.060		.050	.050				
AE	0.010	0.020		.015	.015				
AF	0.240	0.260		.250	.250				
AG	0.290	0.310		.300	.300				
AH	0.115	0.150		.140	.140				
AI	0.454	0.474		.464	.464				
AJ	2.779	2.789		2.784	2.784				
AK	0.240	0.260		.250	.250				
AL	1.002	1.042		1.040	1.040				
AM	0.053	0.073		.063	.063				
AN	0.257	0.262	DT8683	.257	.257				
AO	1.663	1.683		1.673	1.673				
AP	0.053	0.073		.063	.063				
AQ	0.022	0.042		.032	.032				
AR									
AS									
Accept/Reject									

Measured by:	<i>MJ</i>
Date:	<i>08/03/12</i>

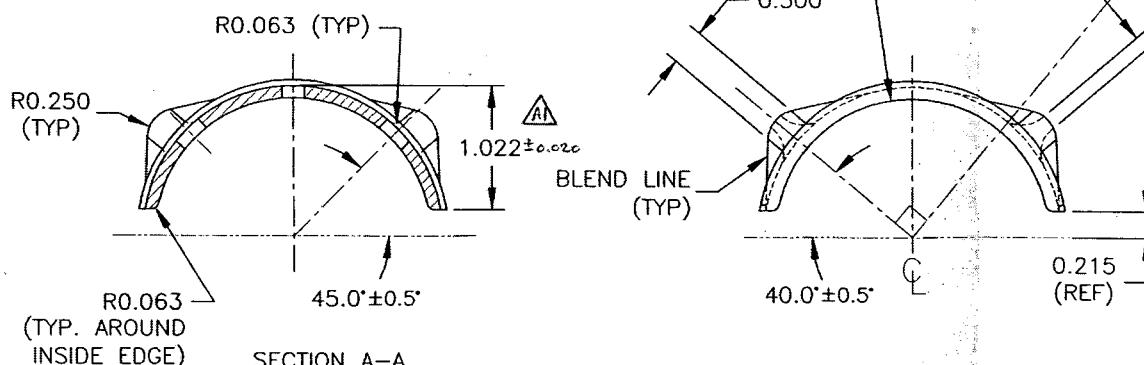
Audited by:	<i>JD</i>
Date:	<i>08/04/12</i>

Rev	Date	Change	Revised by	Approved
A	02.12.12	New Issue	KJ/RF	

D2891-1

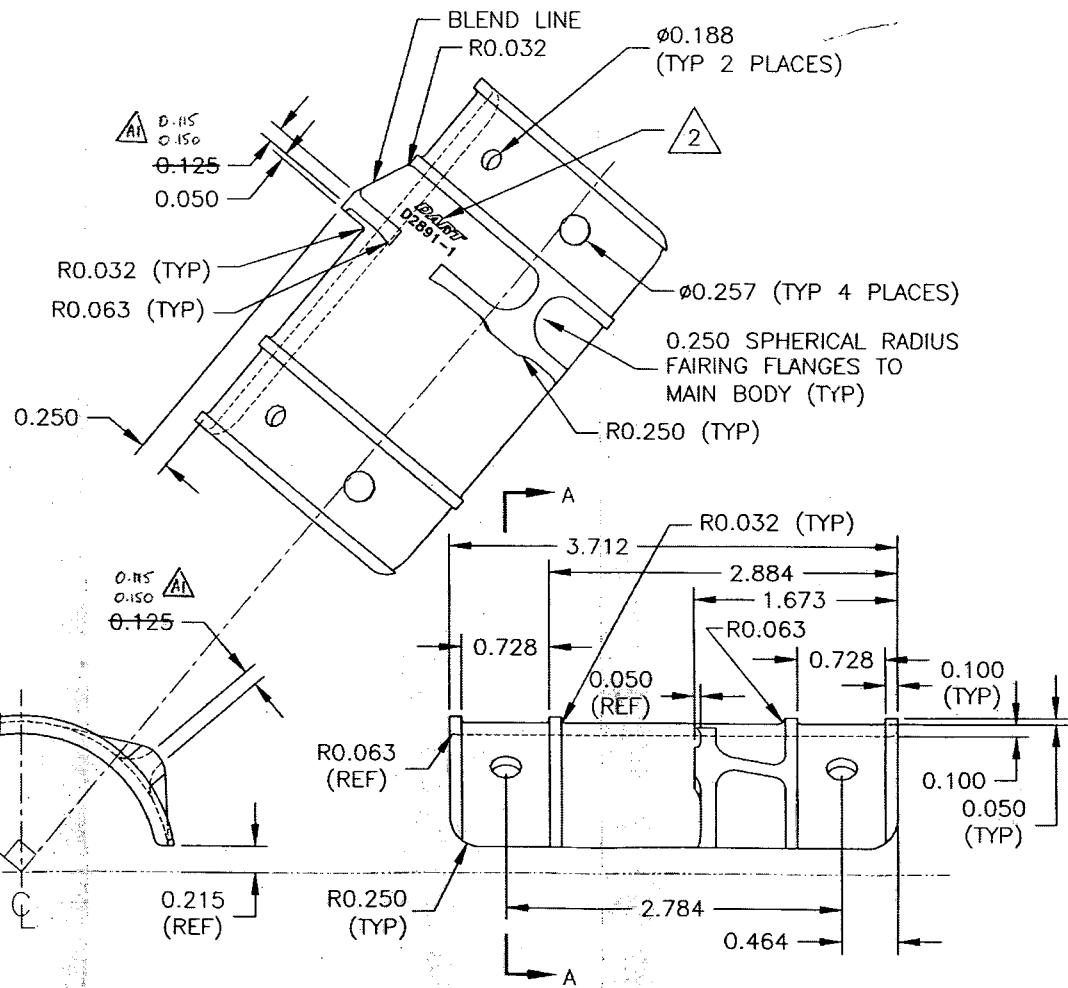
02651-1

- 1) MATERIAL: 17-4 PH STAINLESS STEEL
HEAT TREAT TO H900 CONDITION
(900°F FOR 1 HR, AIR COOL)
MIN UTS = 170 KSI (38 HRc)
- 2) IDENTIFY WITH DART LOGO (PER DART SUPPLIED GRAPHIC) AND PART NUMBER IN THIS AREA WITH 0.125 HIGH LETTERING 0.010-0.020 DEEP.
- 3) BREAK ALL UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) PART IS SYMMETRIC ABOUT CENTERLINE
- 5) TOLERANCES ARE PER DART QSI 018 (REF. X.XXX = ± 0.010) UNLESS OTHERWISE NOTED
- 6) ALL DIMENSIONS ARE IN INCHES
- 7) FINISH: POWDER COAT WHITE (REF. 4.3.5.2) PER DART QSI 005 4.3



SECTION A-A

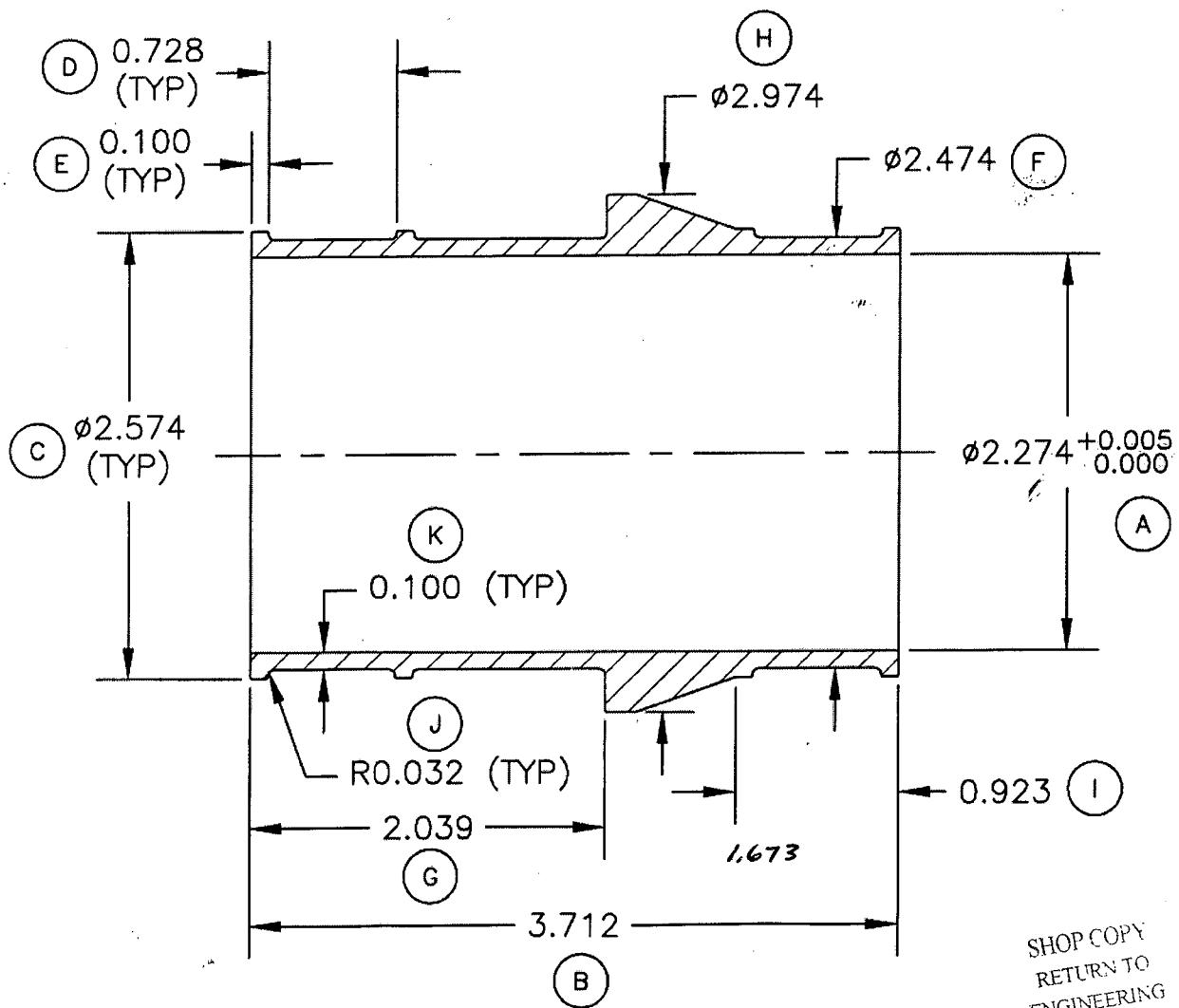
SHOP COPY
RETURN TO
ENGINEERING
CONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 35580



A1	CP 02-01-23		UPDATE DIMS AS MANUFACTURED.
A	00.11.17		NEW ISSUE
DESIGN	DRAWN BY	DART DART AEROSPACE LTD. HAWTHORPE, ONTARIO, CANADA	
CP	CP		
CHECKED	APPROVED	DRAWING NO.	REV. A
		D2891	SHEET 1 OF 1
DATE		TITLE	SCALE
00.11.17		92.250 SUPPORT	1:1

DART

DESIGN RF	DRAWN BY RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA		
CHECKED <i>CH</i>	APPROVED <i>CH</i>	DRAWING NO. DSK 076	REV. A	SHEET 1 OF 1
DATE 03.05.20	TITLE TURNING DETAIL FOR D2891-1			SCALE 1:1
A	03.05.20	NEW ISSUE		

RELEASED
03.07.01 *CH*

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. *35580*

Copyright © 2003 by DART AEROSPACE LTD

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.



P.O. BOX 977
SYRACUSE
NEW YORK 13201

CERTIFICATE OF TEST

A M CASTLE, INC		A M CASTLE, INC		OUR ORDER NO.
3400 N WOLF RD FRANKLIN PARK, IL 60131		26800 MILES RD BEDFORD HEIGHTS OH 44146		25-16226-7-01
CUSTOMER ORDER # & DATE 10-56064		CUSTOMER REQ. #	DISTRICT	DATE 11/01/07
CUSTOMER ORDER # & DATE 10-56064	CUSTOMER REQ. #	DISTRICT	B PARSONS	SHIPPED FROM SYRACUSE

DESCRIPTION OF MATERIAL

GRU 17-4PH RT A IAC 42470
AMC-5174-02 REV 26 ASME-SAB64-07ED T630 ASTM-A564-04 T630
AMS-2103E AMS-5643B (EX SURF) AISI 630 UNS-S17400

SIZE

3.250 RD

HEAT NO.	CHEMICAL ANALYSIS											
	C	MN	P	S	SI	NI	CR	MO	CU	CB	TA	
A19095	.039	.46	.029	.026	.66	4.23	15.22	.13	3.20	.31	.010	

CASTLE METALS CORP

DATE RCVD 11/2/07

IAC 42470

APPROVED BY

QUANTITY	HEAT NO.	MECHANICAL PROPERTIES
----------	----------	-----------------------

981 2 A19095

HARDNESS
BHN 358CAPABILITY PHYSICALS AFTER 900 DEG. F. + 1 HR. AIRCOOL:
199,390 176,620 12.6 50.2

BHN 401

MACRO TEST OK

FERRITE 5.0%

MAGNAFLUX P/S = 0/0

ELECTRIC FURNACE AND MELTED

REDUCTION RATIO 27.5:1

MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 45 MIN
AIRCOOLED.

AT TEMPERATURE -

CRUCIBLE MATERIALS CORP. VENDOR #18610.

MATERIAL INGOT CAST.

NFTTA - YES

CORRECTED COPY ORIGINAL SENT 10/17/07

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
NO WELD REPAIR PERFORMED
MATERIAL MELTED IN U.S.A.THANK YOU FOR SELECTING A QUALITY PRODUCT
MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORDANCE
WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH THOSE
SPECIFICATION REQUIREMENTS.

CRUCIBLE MATERIALS CORPORATION
ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

SWEORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF 20

CERTIFIED
BY:

NOTARY PUBLIC

JACKIE L. WHITE - SPECIFICATION EXAMINER

QUALITY ASSURANCE REPRESENTATIVE





P.O. BOX 977
SYRACUSE
NEW YORK 13201

CERTIFICATE OF TEST

SHIP TO		OUR ORDER NO.	
A H CASTLE, INC 3400 N WOLF RD FRANKLIN PARK, IL 60131	S H I P T O A H CASTLE, INC 26800 MILES RD BEDFORD HEIGHTS OH 44146	PO-11330-7-1	DATE 07/16/07

CUSTOMER ORDER # & DATE	CUSTOMER REQ. #	DISTRICT	SHIPPED FROM
10-31163		R PARSONS	SYRACUSE

DESCRIPTION OF MATERIAL

SIZE

CRU 17-4PH RT A IAC 42470
AMC-3174-10 REV 7 ASME-SA564-04ED T630 ASTM-A564-04 T630
AMS-S6430 AISI 630 UNS-S17400

3,250 RD

HEAT NO.	CHEMICAL ANALYSIS											
	C	MN	P	S	SI	NI	CR	ND	CU	CB	TM	
A18939	.037	.42	.027	.022	.63	4.05	15.28	.11	3.22	.29	.012	

CASTLE METALS CORP.
DATE RCVD 7/25/07
IAC 42470
APPROVED BY MF

QUANTITY	HEAT NO.	MECHANICAL PROPERTIES					
		TENSILE PSI	YLD. 2% PSI	ELONGATION	SELDOM/PEAK	MARSHALL	BRINELL
10.00 ± A18939							
CAPABILITY PHYSICALS AFTER 900 DEG. F. + 1 HR. AIRCOOLED		205,000	174,000	12.5	51.1	SC 35	BRN 415

MACRO TEST OK
FERRITE 0 %
MAGNAFLUX F/S = 0/0

REDUCTION RATIO: 27.5:1
MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 45 MINUTES AT TEMPERATURE
AIRCOOLED.

CRUCIBLE MATERIALS CO., VENDOR #18510
MATERIAL INGOT CAST.
NAFTA = YES

MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT
NO WELD REPAIR PERFORMED
MATERIAL MELTED IN U.S.A.

THANK YOU FOR SELECTING A QUALITY PRODUCT
MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS

THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORD
WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH
SPECIFICATION REQUIREMENTS.

CRUCIBLE MATERIALS CORPORATION
ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF July, 2007

CERTIFIED
BY:

QUALITY ASSURANCE REPRESENTATIVE

NOTARY PUBLIC